DECEMBER
1968
45¢

Live Steam

THE MONTHLY MAGAZINE FOR ALL LIVE STEAMERS AND LARGE-SCALE MODEL RAILROADERS

A Three-Foot Gauge Shay In California

Newest Live Steam Club Is Inland Empire Live Steamers

Live Steam
magazine

DECEMBER 1968 VOL. 2 NO. 12

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COVER PHOTO

Three-truck Shay #10 of the Yosemite Mountain — Sugar Pine Railroad winds along the three-foot gauge tracks in California.

SUBSCRIPTIONS start with January, May or September issue: $4.50 per year in U.S.A. and Canada (U.S. Funds), $5.50 per year (U.S. Funds) in other countries.

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PUBLISHED MONTHLY by William C. Fitt, 1285 North Twenty-Seven Road, Cadillac, Michigan 49601

Address all mail to

LIVE STEAM
Post Office Box 635
Cadillac, Michigan 49601

SECOND CLASS POSTAGE PAID AT CADILLAC, MICHIGAN.

YOSEMITE MOUNTAIN - SUGAR PINE RAILROAD

operates with three-foot gauge three truck Shay

Just four miles from the South Entrance of Yosemite National Park on Highway 41 (next to the Swiss Melody Inn), a three-foot gauge Shay makes a journey into history of logging in years past. Not loaded with logs, but with the children and parents that find themselves up Yosemite way. The man responsible for its being is its president, Rudy Stauffer.

The eventual route will travel over three trestles bridging gurgling streams with breathtaking views of waterfalls and snow-capped peaks. It will make a loop around a garden of pines, cedars, oaks and other native trees and plants of the area where a picnic spot will be prepared for those passengers wishing to linger a little longer in these surroundings. Someday, and not too far off in the future, the narrow gauge tracks will extend to the giant sequoias in Nelder Grove to bring back a small amount of history.

The three truck Shay #10 (ex-West Side Lumber Company #10) hauled her last logs to Tuolumne (about 100 miles east of San Francisco) in 1961. She was the first fired up at her new home, Yosemite Mountain, on August 28th, 1967, having undergone some minor mechanical work and a shiny new black paint job. She looked pretty sharp running over the then-completed 950 feet of track!

By May of 1968, all of the equipment purchased from West Side Lumber Company had been moved to the new location. This included (besides the Shay) 11 skeleton log cars, 1 tank car, 1 side dump gravel car, 2 speeders, 1 four-wheel tool car, 1 four-wheel crane car and several tons of spare parts and tools which have been neatly sorted into bins in the two-stall engine house. There is also a ten-ton gasoline 0–4–0 built by Vulcan which will be used primarily for track construction and minor switching chores . . . and for emergency back up for the #10.

The main line follows the grade of the old Madera Sugar Pine right-of-way (last used in 1924) wherever possible. It has an almost constant 4% grade down from the Swiss Melody Inn to the reverse loop. Helped by a light snowfall during the 1967–1968 winter, the right-of-way was cleared for well over a mile. Culverts have been installed and grading has been completed to the 7,000 foot point. Practically all of the finished track has been ballasted from a borrow pit alongside the right-of-way which eliminated any trucking. The Vulcan and the gravel car handled all of that phase of the work. As of the middle of June, 1968, 3,500 feet of track had been completed making a round trip of approximately 1½ miles.

Passengers ride on two logs, quarter-sawn lengthwise to form benches and permanently secured to the log cars. When viewed from the side it appears that the #10 is back in the log-hauling business.

To get down to Lewis Creek, two trestles will have to be built. Timbers for these two trestles have been purchased second-hand from the Southern Pacific Railroad which is rebuilding a 600 foot long trestle over Castaic Creek on the line between Saugus and Ventura, California. The Yosemite Mountain — Sugar Pine Railroad purchased all the ties and deck timbers from this trestle and these will provide enough timbers to construct its two trestles.

Trains run daily from Memorial Day through Labor Day and weekends thereafter as conditions permit. Plan to include this steam trip in your vacation itinerary this summer.

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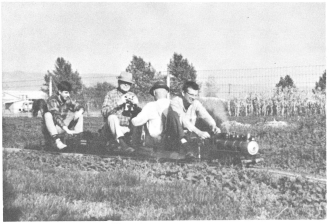
YM–SP #10 is right at home with a log car, even if it is used to cleverly conceal seats for steam fans from one to one hundred years old! ↑

Readying the right-of-way for the coming of steam is one of the honorable tasks of the #5, a Vulcan 0–4–0, and the line's only hopper car. ↓

Inland Empire

Eugene Hawk with the Jerkwater Southern #1 gives a boost up a 2% grade to Lee Tillotson with his Elk River #1. Passengers are Lee Wilhelmi with camera and Lee Harrod with his back to the photographer.



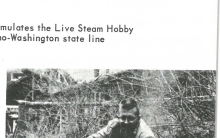
The latest addition to the fast-growing list of Live Steam Clubs has been formed in the Eastern Washington – Western Idaho area of the country. The *Inland Empire Live Steamers* has been formed by eight active hobbyists as an informal club with only an acting secretary in the way of officers. At least for the time being no club track is planned but meetings are held at member's tracks in Spokane, Coeur d'Alene and Lewiston.

Al Chapman's *Idaho Short Line* in Coeur d'Alene, Idaho, provides 500 feet of 3½" gauge track laid on eight-inch pine logs, flattened on the top side for fastening ties. The track varies from near ground level to seven feet off the ground. A rather unique system of wyes at each end of the track with spring switches enables an engineer to turn his engine without getting off to line the switches. The tail track on the lower wye goes back into a hillside and has a wooden tunnel portal . . . a beautiful setting on a north slope through pine trees and underbrush. Al has a Pacific and two-truck Heisler operating with an Atlantic and a Northern under construction, all in ¾" scale.

Live Steamers

New group stimulates the Live Steam Hobby along the Idaho-Washington state line

Al Chapman with his Idaho Short Line heavy Pacific in ¾" scale (across page), Ivan Ergish and the 1" scale Jerkwater Southern's 2-6-2T #1 (above, left), Russ Moffitt with Ivan's engine and Lee Tillotson's 1" Elk River 0-6-0 provide those wonderful Live Steam smells as incentive and encouragement to the rest of the membership in the Inland Empire Live Steamers. Jerkwater Southern #1 is shown below at the line's engine terminal in Lewiston, Idaho.

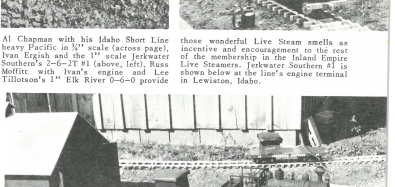


The *Elk River Railroad* is Lee Tillotson's 1" facility near Spokane, Washington. It provides 130 feet of portable 4¾" gauge track for the group at present and regularly operates Lee's 1" 0-6-0.

Down in Lewiston, Idaho, Ivan Egish puts in time on the *Jerkwater Southern*, 450 feet of 4¾" track in an oval with 50 feet of track devoted to sidings and terminal facilities. Ivan has a 1" scale 2-6-2T in operation and a 1" 2-4-0 under construction.

Besides those engines listed above, A. L. Dokken is working on a 1" scale Atlantic; Eugene Hawk has a 2-6-2 under way in 1" scale; Ted Green spends his spare time on a 1½" 4-4-0; Ed Grant recently purchased a 1" 4-4-0 chassis and will be completing that and Norm Hackhalter got the "feel" of 1" scale by building a flat car and will be starting a locomotive soon.

There's nothing like personal contact with fellow Live Steamers to talk over your construction problems or to just share a common interest. If you are interested in meeting with these Live Steamers, contact Ivan Ergish at 915 Vista Avenue in Lewiston, Idaho 83501.



Northern Illinois Live Steamers working hard

Fabricating ties for the track - laying, lining up materials and equipment for Spring construction and just talking about Spring keep the Northern Illinois Live Steamers busy.

From the report in their monthly bulletin, though, all of the activity of this ambitious group is not confined to the club track. They report that amongst the club members there are thirteen ¾", eight 1" and three 1½" locomotives running plus nine ¾", nine 1" and eleven 1½" engines presently under construction.

This will provide plenty of Live Steam activity when the track is done in the spring and if you want to have a part in their activity, contact Bud Novy, Secretary, 724 Suffolk Avenue, Westchester, Illinois 60135 for more information.

Live Steam pace quickens in British Columbia

The British Columbia Society of Model Engineers meets at 8:00 p.m. on the first Thursday of every month in the Bonsor Recreational Center at 6637 Fern Avenue in South Burnaby, British Columbia. There are seven or more ¾" scale locomotives under construction with many of them close to running condition.

Interested persons may obtain additional information by contacting the secretary, W. Jim Summerby, 5445 Chambers Street, Vancouver 16, B. C., phone 604 — 435-6153.

New track at Windsor for Ontario Sunparlor Lines

Three thousand ties and 1300 lbs. of ¼ x 5/8 hot rolled steel are about all that was left unassembled at Windsor the first of September. All of the concrete footings and supporting "A" frames had been erected and the 2 x 6 Douglas Fir stringers attached . . . so the material that remained looked much smaller than the stacks that stood there last spring.

It was, however, a little late in the season to hope for completion in time for a Fall Meet but there would be time to finish the trackwork and new steaming area tracks before the bad weather set in. With a winter of "seasoning" and some warm spring days to make the final touches, the track should be ready for a spring meet in 1969.

Jack Hart is Secretary of the Ontario Sunparlor Lines and anyone interested in joining with this active group should contact him at 1381 Shepherd Street in Windsor, Ontario.

Scheduled Meets dates will help summer planning

With a new year upon us it becomes important for us to list the dates of Scheduled Meets at the various clubs so that Live Steamers from all around the country can plan their summer trips to coincide.

By making your dates known at the earliest possible moment, we will carry them each month in LIVE STEAM until the date has passed.

For those clubs who do not continue their Regular Run Days throughout the year, we will appreciate it if you will send us the plans for this calendar year so that they are not overlooked . . . and will be accurate.

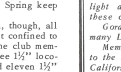
GORDON CORWIN of Highland, California, passed away on December 29th, 1968. He will be sorely missed as he contributed much to the Live Steam hobby.

He was a member of the Southern California Live Steamers, the Golden Gate Live Steamers, the Los Angeles Live Steamers, the Riverside Live Steamers and the Goleta Valley Railroad Club . . . a leading light and a driving force in the development of these clubs.

Gordon was a fine craftsman as shown in the many Live Steam projects that he worked on.

Memorial contributions in his name may be made to the San Bernardino Heart Fund, San Bernardino, California.

Scheduled Meets



April

12 Chicago Model Engineers to Ass'n.
20 Annual Exposition
Museum of Science & Industry
Bill Holtz, Secretary
8332 S. Hamilton Avenue
Chicago, Illinois 60620

June

7 Iowa Model Steam Engineers
8 Annual Spring Meet
Pershing G. Scott, Secretary
R.F.D. 1
Marion, Iowa 52302

September

6 Iowa Model Steam Engineers
7 Annual Fall Meet
Pershing G. Scott, Secretary
R.F.D. 1
Marion, Iowa 52302

Regular Run Days

Golden Gate Live Steamers
Every Sunday, weather permitting
2½" – 3½" – 4½" – 7½"
Don Downer, Secretary
1274 36th Avenue
San Francisco, Calif. 94122

Janul Valley Railroad
3rd Sunday of each month
7½" gauge
Harry F. Haas
Route 1, Box 47 A
Jamul, California 92035

Los Angeles Live Steamers
1st Saturday-Sunday each month
3½" – 4½" – 7½"
William Harper, Secretary
4 Rowhide Lane
Rolling Hills Estates, Calif. 90274

Riverside Live Steamers
4th Saturday–Sunday each month
7½" gauge
Francis H. Smith, Secretary
P. O. Box 5312
Riverside, Calif. 92507

Southern California Live Steam Club
3rd Sunday each month
3½" – 4½" – 7½"
K. G. Kepner, Secretary
2764 Maple
Rialto, California 92376

RONALD W. CHRISTENSEN of Des Moines, Iowa, passed away on November 10th, 1968.

Ron was a very avid Live Steamer, well-known throughout the mid-west as he probably visited more Live Steamers than any other person. Armed with movie and still cameras, Ron was a sort of ambassador from Iowa and it was always a pleasure to see the film records of his travels.

His keen enthusiasm for Live Steam helped to build the membership of the Iowa Club. His own locomotives were always at the disposal of visitors and the time he spent at his own home track introduced and encouraged many fine Live Steamers in the hobby.

He will be missed by his many friends who extend their sympathies to his wife, Bert, and to his family.

Film library being established by Live Steamers

All Live Steamers will benefit from the project just announced by the Southern Minnesota Live Steamer Association. They are building a library of 16mm sound films produced by many sources featuring steam railroading or railroading in general.

Initial cooperation has been encouraging with two prints of "The Last of the Giants" from the Union Pacific, "Thundering Rails" and "Whistles in the Night" from the American Association of Railroads as well as a steam safety film from the Great Northern. There are others currently being checked out and it is hoped that response will be as gratifying.

The plan of the library is to make these one-of-a-kind films available to Live Steam Clubs for showing at meetings or summer meets with the only charge being the postage and insurance.

These films, of course, are quite old and will require extreme care in their use. To have them copied is quite expensive... but the SMLSA is also preparing for that. They have located a supply of Color-Rich reproductions of locomotive renderings done by Robert Kern, an accomplished artist and authority on American Railroading which will be sold to provide a fund for having these old films duplicated.

The portfolio includes four full-color drawings of historic locomotives reproduced in a technique that gives amazing realism to the pictures. As one moves past them, the highlights and reflections change and shadows deepen to create an effect of depth. Included are highly-detailed drawings of "The Missouri" built in 1861 for the Hannibal & St. Joseph Railroad where the railway mail car originated; "The William Crooks" of the St. Paul & Pacific Railroad; "Union Pacific No. 119," the 4-4-0 that took part in the Golden Spike Ceremony a hundred years ago and the "C. P. Huntington" of the Central Pacific which is familiar to Live Steamers as an 1½" scale model by Little Engines. The etchings are 10" x 4", mounted on a white framing mat 13" x 7" and are available at $4.00 per set from the Southern Minnesota Live Steamer Association, 220 First Avenue, S.W., Rochester, Minnesota 55901. While we are at it, why not order two sets? When our wives see them, they are sure to want them framed for the living room and we'll be without a set for the shop or den!

If you want to know more about the films that are available... or if you can help with arrangements for locating any films for this library project, contact Richard M. Winkle, President of the Southern Minnesota Live Steamer Association at the Rochester address just above.

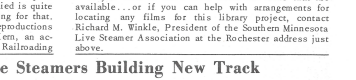
Waushakum Live Steamers Building New Track

Just a short distance west of Boston an active group of Live Steamers have been operating for several years. Busy building beautiful Live Steam locomotives in ¾" scale, the Waushakum Live Steamers operate them regularly on an 1100 foot dog-bone shaped track between Framingham and Hollister, Massachusetts.

"We have started a new track at Captain Child's place in Holliston," reports Club President George Hildreth, "and it will be ¾" scale only unless we get some members who are interested in 1" scale."

The club at present has twenty-two members with eighteen locomotives in operation and at least two under construction. Look at the variety in their motive power: George Hildreth 2-6-0, 4-8-2, 2-10-0; George Dimond 4-6-2, 4-6-4, 4-8-2; W. Van Brocklin, Jr., 4-4-0, 4-2; Putnam Clark 4-6-2, 4-6-0, 4-4-0; Wendell Bishop 4-8-4; George Bailey building a 4-6-4T; Art Butler 4-6-2 with a 4-4-2 under construction; Captain Child 4-6-4; Tom Dinimio 2-4-0; Al Fletcher 4-4-2; Doug Fitzpatrick 4-6-2; Al Griffin 4-6-4.

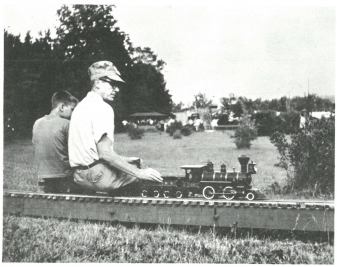
If you are interested in meeting with this group, why not contact George Hildreth, President of the Waushakum Live Steamers at 357 Bishop Street, Framingham, Massachusetts 01701. They would be pleased to hear from you.



With steam up at the Waushakum Live Steamer's track are (l to r) Art Butler with his Pacific, Al Griffin and his Hudson, Dan Pirtle with George Hildreth's Hudson now owned by Captain Child, George Hildreth with his 4-8-2 and Roy Sanders with his Pacific which was also built by Club President George Hildreth. Below is Hildreth taking water on his ¾" 4-8-2.

building the RARITAN

by William H. Morewood



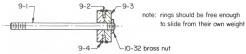
The Piston Assembly (9–5) shown here is a completion of the section shown in the previous installment. No special mention need be made of these parts.

Shown at the left is Bill Scott, builder of the first RARITAN, running his engine on the track of the New Jersey Live Steamers. Bill built the parts for this engine as soon as each drawing was finished. The author tells us that, had it not been for Bill Scott's interest, encouragement and requests for "the next drawing," this project might never have been completed.

A resident of Sellersville, Pa., Bill had previous experience building model airplane engines and planes together with a beautiful radio controlled electric boat model. A Mechanical Engineer by profession, Bill has been connected with the design, construction and run-in of various types of production equipment since the completion of his Army duty in 1946.

piston assembly

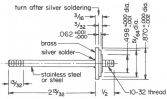
WHM/wcf © WHM 96



9-5 PISTON ASSEMBLY
2 required

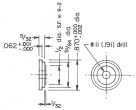
note: after machining, place 9-4 piston rings on a .803 dia. mandrel and compress using a .885 i.d. sleeve. clamp in place with two sleeves having an i.d. of .870

remove the outer sleeve and turn the ring to a diameter of .875

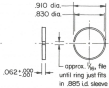


9-1 PISTON ROD
2 required

9-2 SPACER
Brass - 2 required



9-3 PISTON DISC
Brass - 2 required



9-4 PISTON RING
Cast Iron - 4 req'd

PART THREE

VALVE GEAR

SO YOU WANT TO BUILD A LIVE STEAM LOCOMOTIVE

by Joseph F. Nelson

CHAPTER 10

EARLY VALVE MOTIONS THAT LED TO THE STEPHENSON

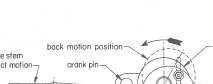
It is impossible to delineate all the valve motions that predated the Stephenson, however, some of the outstanding ones in the evolution from the Shifting Eccentric to the Stephenson Link Motion will be described.

All arrangements for regulating the movement of the valve may be called valve gears, or valve motions. This part of this chapter will be concerned with the valve gear itself rather than the valve. Since it was necessary for the locomotive to operate in both directions, the valve gears then in use on stationary engines where reversal was not required, were not satisfactory when used for locomotives. To obtain a valve motion that would reverse the direction of wheel rotation, early designers labored with many devices; i.e.: Loose eccentrics working between stops, wedge motions, adjustable eccentrics, drop hook, and V-hood motions. While most of these motions could provide a lap and lead, there were no provisions for a variable cut-off. The V-hook motion evolved into the Stephenson Link Motion about 1842. It is to be noted that this motion had been designed in the early 1830's but was not appreciated and was, therefore, not accepted.

About 1842, a Belgian, Walschaerts, patented his first valve gear. His third valve gear was not accepted in this country until about 1904. In the 1870's and 1880's, William Mason of Taunton, Massachusetts recognized its virtues and tried very hard to introduce it. In spite of its excellent performance, it was not accepted until after the turn of the century.

REVERSIBLE SINGLE ECCENTRIC

This motion consisted of a plate fastened to the driving axle and a sliding eccentric which was provided with a large slot that cleared the axle, and a narrow slot that cleared the hold-down studs. The studs were located so as to permit the single eccentric to be moved from one extreme to the other. Also, angular advance was provided so as to permit lap and lead. By bolting the eccentric in some intermediate location between the extremes, different degrees of cut-off could be provided. To make adjustments for cut-off or direction of travel, it was necessary to climb under the locomotive with a wrench and

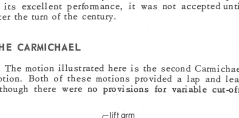


REVERSIBLE SINGLE ECCENTRIC

loosen the retaining nuts and move the eccentric to its desired position. At the period when this motion was used, it was satisfactory for straight running but was not practical for switching where horses had to be used.

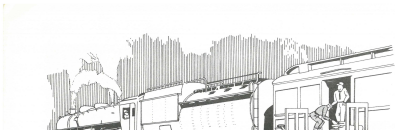
THE CARMICHAEL

The motion illustrated here is the second Carmichael motion. Both of these motions provided a lap and lead although there were no provisions for variable cut-off.



CARMICHAEL HOOK MOTION

Reversing was accomplished by raising and lowering the end of the eccentric rods which were formed into a double V-hook configuration. By raising the end of the eccentric rod (eccentric blade) the V-hook contacted the roller at the top of the rocker arm and gave a direct motion for go-ahead, and by dropping the forward end of the eccentric rod, the V-hook engaged the lower rocker arm roller, giving an indirect action on the valve stem, causing the engine to reverse. While this motion did not provide for lap and lead in its true sense, a small amount of lap and lead was provided by the angularity of the eccentric rod. There was no provision for variable cut-off.



mail stop

MORE ABOUT STAINLESS STEEL BOILERS

For some time I have been concerned about the article that LIVE STEAM carried on stainless steel boilers by Douglas Alkire. While the data he published concerning the properties of the 300 Series stainless steels was accurate as far as it went, it ignored one very important disadvantage in this series of stainless steels.

This is its susceptibility to chloride stress corrosion cracking. It is a very insidious type of failure in that there is no way to determine that this type of failure is occurring until it shatters like a piece of glass. This failure could occur at one section of the boiler and still leave other areas of the metal in the boiler with good ductility characteristics. However, at this localized area, for all practical purposes, you could see that the ductility or percent elongation, is zero. This means that any failure would be a complete shattering at that point, much like a piece of glass.

Any model boiler made in this manner would, in effect, be a time bomb which could explode at any time. The conditions of temperature that we are using in our boilers is ideal for stress corrosion cracking in that it occurs most often in the range of 200 and 300°F. Any water that would be available to use in model boilers is bound to have certain amounts of chlorides present in it and these chlorides will be concentrated due to the steaming action of the boilers.

I feel that it is highly imperative that we warn the "brotherhood" of the hazards of using stainless steel in boilers as it is possible that someone could be badly injured or even killed by the shattering of a model boiler and this could lead to serious restrictions put on our hobby by the authorities.

DAVID M. BOYD
319 RIDGE AVENUE
CLARENDON HILLS, ILL. 60514

pH RANGE FOR BOILER WATER

In Mr. Joseph Nelson's article (LS 6/68) he recommends adding what he calls "sal soda" to give a feed at pH 6.5 – 7.0. With our steel boiler at the Bankstown (Steam Locomotive Society) Club and the 100 HP boiler at work (for which I am responsible, as senior chemist, for water analysis) we work over a pH range of about 7.5 to 8.0 together with sufficient Sodium Sulphite to control corrosion and Calgon to remove hardness which is the cause of scale. We have found these methods (using Magnus chemicals) to be very effective.

GEORGE G. HENNESSY
14 MC CLELLAND STREET
CHESTER HILL 2162
NEW SOUTH WALES, AUSTRALIA

ADVERTISING OUR HOBBY

May I offer a suggestion for advertising this steam fever?

The available B.L.S. decal is not legal in Pennsylvania. Could we design some kind of a shoulder patch or back patch that would advertise our hobby? With the window decal a man parks his car and looses his identity. I might have been standing near to a fellow steam nut and not have known it!

I think LIVE STEAM Magazine is wonderful and Mr. Morewood's plans are just what we beginners need.

WILLIAM M. JONES, JR.
70 RENO LANE
NEW CASTLE, PA. 16101

NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS

1½" SCALE GP-9 ANNOUNCED BY MINI-PRODUCTS

In keeping with the pattern set by his 1½" EMD F-7, Harry Partner (who has formed Mini-Products, Incorporated) now has added an equally imposing model of the EMD GP-9. A new drive system (incorporated in all of their line now) utilizes a 5 HP Briggs and Stratton Engine which drives a hydraulic pump providing power to all eight wheels. This same system furnishes dynamic braking and the brake rigging for the trucks is available for appearance only. The unit features electric starting and all lights operating. The frame and body are all steel construction and can be furnished assembled, painted and ready to run or in kit form. Due to the circuitry and valving in the hydraulic drive, the kit is supplied with the chassis, trucks and drive units assembled and covered by a full warranty – the balance of construction can be handled by the builder. For further information, send $1.50 (refundable with order) to Mini-Products, Inc. 14550 East Eleven Mile Road, Warren, Michigan 48089.

NEW PATTERN LIST NO. 7
¾" – 1" – 1½" scale locomotives and horizontal stationary engine. Send 25¢ with self-addressed #10 envelope with 12¢ postage to

Live Steam Pattern Pool
962 Greenland, Portsmouth, N. H., 03801

ACCURATELY SCALED
115 lb. A.R.E.A. RAIL
12" SAMPLE
SEND 25¢ FOR SAMPLE TO
PAUL B. CULP
617 Fanshawe Street
Philadelphia, Pa. 19111

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Built and Repaired
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MODEL BOILERS
Box 178 Ventura, California 93001

Black line prints from original Cooke, Manchester and Rhode Island Works tracings. Send 50¢ for the lists of drawings.

C. A. PURINTON
R.F.D. Boxford, Mass. 01921

Photos, 1½" scale erection drawings 10 CNR-CPR locos from MLW-Alco tracings, CNR Standard Detail drawings, miscellaneous prints. CATALOG 12-35¢ contains diagram sheets of all locos.
WILLIAM DYKEMAN
890 Bay Ave., Bathurst, N.B., Canada

MINIBOLTS — Perfect little hex head miniature machine bolts in Mild Steel, Brass and Stainless Steel. #0 to #12 diameters in popular and special lengths. For "factory direct" prices write to "BOB" at
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Full-size drawings and castings for building the RARITAN

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18 Laning Avenue – Pennington, N.J. 08534

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1½" scale trucks, couplers, stake pockets, frogs, drivers, etc. Send 25¢ for photo and information
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...from the cupola

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3/4" – 1½" Scale
Castings, Blueprints and Materials
16 Engines in CATALOG #3 – $1.00
FRIENDS MODELS
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3/4" SCALE NYC HUDSON
Castings, drawings, freight trucks, wheels, bolsters, springs. Write for list.
CARL HOFFMAN
25 Thornridge Crescent
Kitchener, Ontario, Canada

Live Steam
THE HOBBYIST'S GUILD

Second Class Postage
PAID
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15" – 16" – 24" – 36" Gauges

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WYANO, PENNSYLVANIA 15695

1" scale trucks and car parts
Send for free list
NELSON W. GRAY
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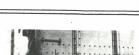
Jamesville, N. Y. 13078



1½" scale roller bearing truck kits, coupler and draft gear kits and complete gondola kits. Illustrated brochure and photos - 25¢.
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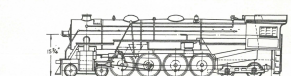
NEW YORK CENTRAL 4–8–4 J–2 CLASS – 1½" SCALE?



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	Length	Drivers	Leading	Trailing	Tractive Effort	Weight
4-8-4	6'-3"	8½"	4¾"	4¾ & 5¾"	260#	1,200#
4-6-4	6'-6"	10 "	4¾"	4¾ & 5¾"	220#	1,100#

Cylinders: 3" Bore x 3½" Stroke, slide valves, Baker valve gear.
7⅞" or 7½" gauge, 1¾" scale.

Drawings (22) - $40.00 Castings (Approx. 110) - $1,175.00

ONE OF 22 PAGES IN THE LOCOMOTIVE SECTION
THE *1969* CRAFTSMANSHIP CATALOG FOR ONE DOLLAR

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P. O. Box 170, Luling, Texas 78648

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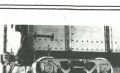

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